

# TS-HC Series snap-in style

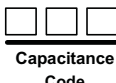
- **Highly miniaturized version (30% smaller than HB series)**
- **2 and 3 pin versions available**
- **2000 hour life at 105°C**
- **Can vent construction**



Rated Working Voltage:	10 ~ 250 VDC	350 ~ 450 VDC											
Operating Temperature:	-40 ~ +105°C	-25 ~ +105°C											
Nominal Capacitance:	270~100000 µF	100 ~ 820µF											
Capacitance Tolerance:	± 20%												
Dissipation Factor: (120 Hz, +20°C)	Working Voltage [V]:												
	10	16	25	35	50	63	80	100 - 450					
	Max. D.F. (%):												
	55	45	35	30	25	20	17	15					
	For capacitance values > 33000µF, add the value of: $\frac{\text{(rated cap. } \mu\text{F)} - 33000}{1000}$												
Leakage Current:	3vCV (µA) max. after 5 minutes; C = Capacitance in µF, V = WV												
Ripple Current Multipliers:	Frequency(Hz):	50	60	100~120	500	1k	10k~	Ripple Current Ambient Temperature Factors*					
	10~100WV:	0.93	0.95	1.0	1.05	1.08	1.15	Ambient Temperature:	105°C	85°C	70°C	60°C	=45°C
	160~500WV:	0.75	0.8	1.0	1.2	1.25	1.4	Multiplier:	1.0	1.7	2.0	2.2	2.35
Endurance:	2000 hours at +105°C with maximum specified ripple current (see page 4)												

\*Use of temperature ripple current multipliers may limit life to the hours specified for the maximum operating temperature.

## Part Number System



Diameter	Diameter / Terminal Code			
	# of pins:	2	2	3
	pin length:	6.3mm	4.0mm	4.0mm
22mm		B	H	P
25mm		C	J	Q
30mm		D	K	R
35mm		E	L	S

(Please see page 7 for details)

Top Vinyl Plate	
A	with plate
	without plate (no suffix)

## TS-HC Standard Ratings (part numbers shown with 2 pins, 6.3mm length terminal, and top vinyl plate)

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A <sub>rms</sub> )		20°C ESR (Ω, max.)		Panasonic Part Number	Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A <sub>rms</sub> )		20°C ESR (Ω, max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz				120Hz	10kHz~	120Hz	20kHz	
<b>10 VDC Working, 13 VDC Surge</b>													
12000	22 x 25	2.20	2.53	0.076	0.065	EETHC1A123BA	<b>16 VDC Working, 20 VDC Surge (continued)</b>						
18000	22 x 30	2.40	2.76	0.051	0.043	EETHC1A183BA	18000	22 x 40	3.50	4.03	0.041	0.035	EETHC1C183BA
	25 x 30	2.40	2.76	0.051	0.043	EETHC1A183CA	25 x 30	3.50	4.03	0.041	0.035	EETHC1C183CA	
22000	22 x 25	2.60	2.99	0.041	0.035	EETHC1A223BA	22000	22 x 45	3.80	4.37	0.034	0.029	EETHC1C223BA
	25 x 30	2.60	2.99	0.041	0.035	EETHC1A223CA	25 x 35	3.80	4.37	0.034	0.029	EETHC1C223CA	
27000	22 x 40	3.10	3.57	0.034	0.029	EETHC1A273BA	30 x 25	3.80	4.37	0.034	0.029	EETHC1C223DA	
	25 x 35	3.10	3.57	0.034	0.029	EETHC1A273CA	27000	22 x 50	4.20	4.83	0.028	0.023	EETHC1C273BA
	30 x 25	3.10	3.57	0.034	0.029	EETHC1A273DA	25 x 40	4.20	4.83	0.028	0.023	EETHC1C273CA	
33000	22 x 45	3.40	3.91	0.028	0.023	EETHC1A333BA	30 x 30	4.20	4.83	0.028	0.023	EETHC1C273DA	
	25 x 40	3.40	3.91	0.028	0.023	EETHC1A333CA	35 x 25	4.20	4.83	0.028	0.023	EETHC1C273EA	
39000	25 x 45	3.70	4.26	0.026	0.022	EETHC1A393CA	33000	25 x 45	4.70	5.41	0.023	0.019	EETHC1C333CA
	30 x 30	3.70	4.26	0.026	0.023	EETHC1A393DA	30 x 35	4.70	5.41	0.023	0.019	EETHC1C333DA	
	35 x 25	3.70	4.26	0.026	0.022	EETHC1A393EA	35 x 30	4.70	5.41	0.023	0.020	EETHC1C333EA	
47000	25 x 50	4.20	4.83	0.024	0.021	EETHC1A473CA	39000	30 x 40	5.10	5.87	0.022	0.018	EETHC1C393DA
	30 x 35	4.20	4.83	0.024	0.022	EETHC1A473DA	35 x 35	5.10	5.87	0.022	0.020	EETHC1C393EA	
	35 x 30	4.20	4.83	0.024	0.021	EETHC1A473EA	47000	30 x 45	5.50	6.33	0.016	0.014	EETHC1C473DA
56000	30 x 40	5.00	5.75	0.023	0.021	EETHC1A563DA	35 x 40	5.50	6.33	0.021	0.019	EETHC1C473EA	
	35 x 35	5.00	5.75	0.023	0.020	EETHC1A563EA	56000	30 x 50	6.00	6.90	0.020	0.018	EETHC1C563DA
68000	30 x 45	5.40	6.21	0.022	0.020	EETHC1A683DA	35 x 45	6.00	6.90	0.020	0.018	EETHC1C563EA	
	35 x 40	5.40	6.21	0.022	0.019	EETHC1A683EA	<b>25 VDC Working, 32 VDC Surge</b>						
82000	35 x 45	6.10	7.02	0.021	0.019	EETHC1A823EA	6800	22 x 25	2.40	2.76	0.085	0.064	EETHC1E682BA
100000	35 x 50	6.90	7.94	0.020	0.019	EETHC1A104EA	8200	22 x 30	2.70	3.11	0.071	0.053	EETHC1E822BA
<b>16 VDC Working, 20 VDC Surge</b>							25 x 25	2.70	3.11	0.071	0.053	EETHC1E822CA	
10000	22 x 25	2.60	2.99	0.075	0.063	EETHC1C103BA	10000	22 x 35	3.00	3.45	0.058	0.044	EETHC1E103BA
12000	22 x 30	2.90	3.34	0.062	0.053	EETHC1C123BA	12000	22 x 40	3.20	3.68	0.048	0.036	EETHC1E123BA
	25 x 25	2.90	3.34	0.062	0.053	EETHC1C123CA	25 x 30	3.20	3.68	0.048	0.036	EETHC1E123CA	
15000	22 x 35	3.20	3.68	0.050	0.042	EETHC1C153BA	15000	22 x 45	3.60	4.14	0.039	0.029	EETHC1E153BA
							25 x 35	3.60	4.14	0.039	0.029	EETHC1E153CA	



TS-HC Standard Ratings (continued)

Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A <sub>rms</sub> )		20°C ESR (Ω, max.)		Panasonic Part Number	Cap. (µF)	Size (mm) D x L	Max 105°C R.C. (A <sub>rms</sub> )		20°C ESR (Ω, max.)		Panasonic Part Number
		120Hz	10kHz~	120Hz	20kHz				120Hz	10kHz~	120Hz	20kHz	
<b>160 VDC Working, 200 VDC Surge (continued)</b>							<b>350 VDC Working, 400 VDC Surge (continued)</b>						
1000	25 x 35	2.20	3.08	0.199	0.090	EETHC2C102CA	330	25 x 40	1.20	1.68	0.502	0.226	EETHC2V331CA
	30 x 25	2.20	3.08	0.216	0.108	EETHC2C102DA		30 x 30	1.20	1.68	0.502	0.226	EETHC2V331DA
1200	22 x 45	2.30	3.22	0.166	0.075	EETHC2C122BA	390	25 x 45	1.30	1.82	0.425	0.191	EETHC2V391CA
	25 x 40	2.30	3.22	0.166	0.075	EETHC2C122CA		30 x 35	1.30	1.82	0.425	0.191	EETHC2V391DA
	30 x 30	2.30	3.22	0.166	0.075	EETHC2C122DA	470	25 x 50	1.40	1.96	0.353	0.159	EETHC2V471CA
	35 x 25	2.30	3.22	0.180	0.090	EETHC2C122EA		35 x 30	1.40	1.96	0.353	0.159	EETHC2V471EA
1500	25 x 45	2.50	3.50	0.133	0.060	EETHC2C152CA	560	30 x 45	1.50	2.10	0.296	0.133	EETHC2V561DA
	30 x 35	2.50	3.50	0.133	0.060	EETHC2C152DA		35 x 35	1.50	2.10	0.296	0.133	EETHC2V561EA
	35 x 30	2.50	3.50	0.155	0.077	EETHC2C152EA	680	30 x 50	1.70	2.38	0.244	0.110	EETHC2V681DA
1800	25 x 50	2.70	3.78	0.111	0.050	EETHC2C182CA		35 x 40	1.70	2.38	0.244	0.110	EETHC2V681EA
	30 x 40	2.70	3.78	0.111	0.050	EETHC2C182DA	820	35 x 45	1.90	2.66	0.202	0.091	EETHC2V821EA
	35 x 30	2.70	3.78	0.120	0.060	EETHC2C182EA							
<b>200 VDC Working, 250 VDC Surge</b>							<b>400 VDC Working, 450 VDC Surge</b>						
390	22 x 25	1.31	1.83	0.510	0.230	EETHC2D391BA	100	22 x 25	0.70	0.98	1.824	0.821	EETHC2G101BA
470	22 x 30	1.45	2.03	0.423	0.190	EETHC2D471BA	120	22 x 30	0.75	1.05	1.520	0.684	EETHC2G121BA
560	22 x 30	1.67	2.34	0.355	0.160	EETHC2D561BA	150	22 x 30	0.88	1.23	1.216	0.547	EETHC2G151BA
680	22 x 40	1.75	2.45	0.293	0.132	EETHC2D681BA	180	22 x 35	0.95	1.33	1.013	0.456	EETHC2G181BA
	25 x 30	1.75	2.45	0.293	0.132	EETHC2D681CA		25 x 30	0.95	1.33	1.013	0.456	EETHC2G181CA
820	22 x 45	2.04	2.86	0.243	0.109	EETHC2D821BA	220	22 x 45	1.10	1.54	0.829	0.373	EETHC2G221BA
	25 x 35	2.04	2.86	0.243	0.109	EETHC2D821CA		25 x 35	1.10	1.54	0.829	0.373	EETHC2G221CA
	30 x 25	2.04	2.86	0.243	0.109	EETHC2D821DA	30 x 25	1.10	1.54	0.829	0.373	EETHC2G221DA	
1000	22 x 50	2.30	3.22	0.199	0.090	EETHC2D102BA	270	22 x 50	1.22	1.71	0.675	0.304	EETHC2G271BA
	25 x 45	2.30	3.22	0.199	0.090	EETHC2D102CA		25 x 40	1.22	1.71	0.675	0.304	EETHC2G271CA
	30 x 30	2.30	3.22	0.199	0.090	EETHC2D102DA	30 x 30	1.22	1.71	0.675	0.304	EETHC2G271DA	
	35 x 25	2.30	3.22	0.216	0.097	EETHC2D102EA	35 x 25	1.22	1.71	0.675	0.304	EETHC2G271EA	
1200	25 x 50	2.65	3.71	0.166	0.075	EETHC2D122CA	330	25 x 45	1.44	2.02	0.553	0.249	EETHC2G331CA
	30 x 35	2.65	3.71	0.166	0.075	EETHC2D122DA		30 x 35	1.44	2.02	0.553	0.249	EETHC2G331DA
	35 x 30	2.65	3.71	0.180	0.090	EETHC2D122EA	35 x 30	1.44	2.02	0.553	0.249	EETHC2G331EA	
1500	30 x 40	2.80	3.92	0.133	0.060	EETHC2D152DA	390	25 x 50	1.55	2.17	0.468	0.210	EETHC2G391CA
	35 x 30	2.80	3.92	0.144	0.072	EETHC2D152EA		30 x 40	1.55	2.17	0.468	0.210	EETHC2G391DA
	35 x 40	3.08	4.31	0.111	0.050	EETHC2D182DA	35 x 30	1.55	2.17	0.468	0.210	EETHC2G391EA	
1800	30 x 45	3.08	4.31	0.129	0.064	EETHC2D182EA	470	30 x 45	1.68	2.35	0.388	0.175	EETHC2G471DA
	35 x 40	3.08	4.31	0.129	0.064	EETHC2D182EA		35 x 35	1.68	2.35	0.388	0.175	EETHC2G471EA
	2200	30 x 50	3.48	4.87	0.090	0.041	EETHC2D222DA	560	30 x 50	1.90	2.66	0.326	0.147
	35 x 45	3.48	4.87	0.098	0.044	EETHC2D222EA	680	35 x 45	2.12	2.97	0.268	0.121	EETHC2G681EA
<b>250 VDC Working, 300 VDC Surge</b>							<b>450 VDC Working, 500 VDC Surge</b>						
270	22 x 25	1.10	1.54	0.614	0.276	EETHC2E271BA	100	22 x 30	0.64	0.90	1.824	0.821	EETHC2W101BA
330	22 x 30	1.20	1.68	0.502	0.226	EETHC2E331BA	25 x 25	0.64	0.90	1.824	0.821	EETHC2W101CA	
	25 x 25	1.20	1.68	0.502	0.226	EETHC2E331CA	120	22 x 35	0.72	1.01	1.520	0.684	EETHC2W121BA
390	22 x 35	1.30	1.82	0.425	0.191	EETHC2E391BA		25 x 30	0.72	1.01	1.520	0.684	EETHC2W121CA
	25 x 25	1.30	1.82	0.425	0.191	EETHC2E391CA	150	22 x 40	0.79	1.11	1.216	0.547	EETHC2W151BA
470	22 x 40	1.40	1.96	0.353	0.159	EETHC2E471BA		25 x 30	0.79	1.11	1.216	0.547	EETHC2W151CA
	25 x 30	1.40	1.96	0.353	0.159	EETHC2E471CA	30 x 25	0.79	1.11	1.216	0.547	EETHC2W151DA	
	30 x 25	1.40	1.96	0.353	0.159	EETHC2E471DA	180	22 x 45	0.87	1.22	1.013	0.456	EETHC2W181BA
560	22 x 45	1.50	2.10	0.296	0.133	EETHC2E561BA		25 x 40	0.87	1.22	1.013	0.456	EETHC2W181CA
	25 x 35	1.50	2.10	0.296	0.133	EETHC2E561CA	30 x 30	0.87	1.22	1.013	0.456	EETHC2W181DA	
	30 x 25	1.50	2.10	0.296	0.133	EETHC2E561DA	220	25 x 45	1.00	1.40	0.829	0.373	EETHC2W221CA
680	22 x 50	1.70	2.38	0.244	0.110	EETHC2E681BA		30 x 30	1.00	1.40	0.829	0.373	EETHC2W221DA
	25 x 40	1.70	2.38	0.244	0.110	EETHC2E681CA	220	35 x 25	1.00	1.40	0.829	0.373	EETHC2W221EA
	30 x 30	1.70	2.38	0.244	0.110	EETHC2E681DA		270	25 x 50	1.19	1.67	0.675	0.304
820	35 x 25	1.70	2.38	0.244	0.110	EETHC2E681EA	30 x 40	1.19	1.67	0.675	0.304	EETHC2W271DA	
	25 x 45	2.00	2.80	0.202	0.091	EETHC2E821CA	35 x 30	1.19	1.67	0.675	0.304	EETHC2W271EA	
	30 x 35	2.00	2.80	0.202	0.091	EETHC2E821DA	330	30 x 45	1.38	1.93	0.553	0.249	EETHC2W331DA
35 x 30	2.00	2.80	0.202	0.091	EETHC2E821EA	35 x 35		1.38	1.93	0.553	0.249	EETHC2W331EA	
1000	30 x 40	2.20	3.08	0.166	0.075	EETHC2E102DA	390	30 x 50	1.55	2.17	0.468	0.210	EETHC2W391DA
1200	30 x 45	2.30	3.22	0.138	0.062	EETHC2E122DA		35 x 40	1.55	2.17	0.468	0.210	EETHC2W391EA
1500	35 x 45	2.50	3.50	0.111	0.050	EETHC2E152EA	470	35 x 45	1.74	2.44	0.388	0.175	EETHC2W471EA
1800	35 x 50	2.70	3.78	0.092	0.041	EETHC2E182EA	560	35 x 50	1.90	2.66	0.326	0.147	EETHC2W561EA
<b>350 VDC Working, 400 VDC Surge</b>													
120	22 x 25	0.75	1.05	1.382	0.622	EETHC2V121BA							
150	22 x 30	0.82	1.15	1.105	0.497	EETHC2V151BA							
180	22 x 30	0.90	1.26	0.921	0.414	EETHC2V181BA							
	25 x 25	0.90	1.26	0.921	0.414	EETHC2V181CA							
220	22 x 35	1.00	1.40	0.754	0.339	EETHC2V221BA							
	25 x 30	1.00	1.40	0.754	0.339	EETHC2V221CA							
270	25 x 35	1.10	1.54	0.614	0.276	EETHC2V271CA							
	30 x 25	1.10	1.54	0.614	0.276	EETHC2V271DA							